A STUDY ON EFFECTIVENESS OF INTERCOSTAL STRETCH ON PULMONARY FUNCTION PARAMETERS IN BRONCHIAL ASTHMA MALE PATIENTS

A Dissertation Submitted to

THE TAMILNADU Dr. M.G.R. MEDICAL UNIVERSITYCHENNAI

In partial fulfilment of the requirements for the award of the

MASTER OF PHYSIOTHERAPY

Degree Programme

Submitted by

Reg. No: 271430208

Submitted to

THE TAMILNADU DR.M.G.R. MEDICAL UNIVERSITY

Chennai-32

PPG COLLEGE OF PHYSIOTHERAPY

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COIMBATORE – 641 035

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The Dissertation entitled

"A STUDY ON EFFECTIVENESS OF INTERCOSTAL STRETCH ON PULMONARY FUNCTION PARAMETERS IN BRONCHIAL ASTHMA MALE PATIENTS"

Submitted by

Reg. No.271430208

Under the guidance of

Dr. K. RAMA DEVI M.P.T.(Cardio-Resp).,

PROFESSOR

A Dissertation submitted to

THE TAMILNADU Dr.M.G.R. MEDICAL UNIVERSITY

CHENNAI-32

Dissertation Evaluated on ____________________________

Internal Examiner **External Examiner**

CERTIFICATE I

This is to certify that project entitled "**A STUDY ON EFFECTIVENESS OF INTERCOSTAL STRETCH ON ULMONARY FUNCTION PARAMETERS IN BRONCHIAL ASTHMA MALE PATIENTS"** was carried out by **Reg. No:271430208,** P.P.G.College of Physiotherapy, Coimbatore-35, affiliated to The Tamilnadu Dr. M.G.R. Medical University, Chennai-32, under the guidance of **Prof. K. RAMA DEVI M.P.T (Cardio-Resp).,**

Prof.K.RAJA SENTHIL M.P.T (Cardio-Resp)., MIAP.,(PhD).,

PRINCIPAL

CERTIFICATE II

This is to certify that the dissertation work entitled **"A STUDY ON EFFECTIVENESS OF INTERCOSTAL STRETCH ON PULMONARY FUNCTION PARAMETERS IN BRONCHIAL ASTHMA MALE PATIENTS"** was carried out by **Reg. no**. **271430208** P.P.G College of physiotherapy,Coimbatore-35,affiliated to The Tamilnadu Dr. M.G.R Medical University ,Chennai-32, under my guidance.

Dr. K. RAMA DEVI M.P.T.(Cardio-Resp).,

PROFESSOR

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Several special people have guided me and have contributed significantly to this effort. I thank my **faculty members** for their constant support and cheer all along in achieving the goal.

My hearty thanks to each and every **Subject** who co-operated to do my project work in great success.

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A STUDY ON EFFECTIVENESS OF INTERCOSTAL STRETCH ON PULMONARY FUNCTION PARAMETERS IN BRONCHIAL ASTHMA MALE PATIENTS

ABSTRACT

BACKGROUND

The use of manual stretching procedures has become more prevalent in cardio respiratory physiotherapy to improve pulmonary functions. However, limited evidence exists regarding evaluation of their effectiveness.

AIM OF THE STUDY

The study aimed to determine the impact of Intercostal (IC) stretch in improving the dynamic pulmonary function parameters (Forced Expiratory Volume in the first second (FEV1), Forced Vital Capacity (FVC) and FEV1/FVC % and respiratory rate among male asthma patients.

SAMPLE SIZE

Thirty male asthma subjects were recruited based on inclusion and exclusion criteria.

SAMPLE METHOD

Subjects were assigned to the experimental group and the control group through random sampling method

STUDY DESIGN

In the experimental group, subjects underwent IC stretch for ten breaths on the inspiratory phase of the respiratory cycle with breathing control exercises in semi recumbent position, while in the control group, breathing control exercises alone were performed in the semi recumbent position.

RESULT

The results of the study showed, FEV1/FVC % in the experimental group significantly improved with $P=0.017$ ($p<0.05$) than the control group, which means IC stretch increased lung volume and lead to improved lung function.

CONCLUSION

This study suggested the IC stretching with breathing control may be more effective in improving dynamic lung parameters especially FEV1/FVC % than breathing control alone.

KEYWORDS

Intercostal muscles, spirometer, vital capacity, breathing exercises.

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CHAPTER I

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Intercostal (IC) muscles are diverse and widely spread throughout the rib cage. These muscles are morphologically and functionally skeletal muscles, and it helps in upward and outward movement of the ribs which results in increase in antero-posterior diameter of the thoracic cavity.

The IC muscles help both in inspiration and forced expiration. Even though these muscles engage in respiration, their activities are fewer during active contraction among male asthma patients. This will have an impact on the oxidative capacity of the skeletal muscles and it will reduce the proportion of muscle fibres from type I to type II.

Hence, it can be hypothesized intercostal muscles which aids in the mechanical aspects of breathing may undergo atrophy when there is a poor physical activity.

Therefore, this could have an impact on chest wall mobility and expansion in turn to ventilation on male asthma patients.

Various research studies demonstrated that IC stretching improved expired tidal volume decreased the level of dyspnoea level and increased chest expansion clinically which results in better gaseous exchange inhuman subjects. IC stretch is performed actively by thoracic mobility exercises.

Passively IC stretch can be performed by thoracic rotation, mid sternum rotation, lateral thoracic stretching, through thoracic mobility exercises as well as through manual stretching of IC spaces .

The external IC muscles which are helpful during inspiration showed a higher discharge activity during forcible inhalation. Similarly, a stretch of 15 micrometres applied to IC spaces showed an increase in muscle activity in cats. The increase in muscle activity of the IC muscles could lead to increase In lung volume and capacities.

According to Puckree, IC stretching is effective in improving breathing pattern and respiratory muscle activity among male asthma subjects.

However; none of the research studies examined the effect of IC Stretching on dynamic pulmonary function parameters among male asthma subjects.

Morphologically intercostal muscles displayed a variation in fibre size and atrophy among obstructive lung disease subjects.

Hence, a change in pulmonary function parameters while performing IC stretching might benefit to a particular population where respiratory compromise has been demonstrated due to poor IC muscle function.

Therefore, the main purpose of the study was to observe the effect of IC stretching on pulmonary function parameters.

1.2NEED OF THE STUDY

Bronchial asthma is the most prevalent respiratory disability of adults being the fifth most common cause of death affecting approximately 20% of the population.

Bronchial asthma have respiratory weakness, it may contribute dyspnoea and decrease exercise tolerance.

Need of the study was to improve the exercise tolerance and to induce the low cardiopulmonary demands.

1.3AIM OF THE STUDY

The aim of the study was to find out the effect of intercostal stretch on pulmonary parameters in bronchial asthma male subjects.

1.4OBJECTIVES OF THE STUDY

- To assess the effect of intercostal stretch on pulmonary function parameters in bronchial asthma subjects.
- To assess the effect of intercostal stretch increase in respiratory muscle activity and improving breathing pattern.
- To determine the effect of intercostal stretch in increase of lung volume and capacities

1.5 HYPOTHESIS

NULL HYPOTHESIS

The null hypothesis states that there was no significant change in the effect of intercostal stretch in bronchial asthma subjects

ALTERNATE HYPOTHESIS

The alternate hypothesis states that there was a significant effect of intercostal stretch in bronchial asthma subjects.

1.6 OPERATIONAL DEFINITION

BRONCHIAL ASTHMA

Bronchial asthma is a common disease marked by breathlessness and wheezing caused by generalised narrowing of intrapulmonary airways.

The changes causing airways obstruction in asthma include hypertrophy and hyperplasia of bronchial smooth muscle, thickening of epithelial basement membrane of airways, oedema and eosinophilia infiltration of the bronchial wall and hypertrophy of the bronchial mucus glands with increase in the number of cobledcells

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MUSCLE

A body tissue composed sheath or bundles of cells that contract to produce movement or increase tension muscle cells contain filaments made of body protein actin and myosin which lie parallel to each other

STRETCH

Stretching is a form of physical exercise in which a specific muscle or tendon is deliberately flexed or stretched in order to improve the muscle's felt elasticity and achieve comfortable muscle tone.

CHAPTER II

REVIEW OF LITERATURE

1. Leelarungrayub et al.,2009; Bethune, 1975.

This study demonstrated that IC stretching improved expired tidal volume, decreased the level of dyspnoea level and increased chest expansion clinically which results in better gaseous exchange inhuman subjects

2. De Troyer et al., 2005.

These muscles are morphologically and functionally skeletal muscles, and it helps in upward and outward movement of the ribs which results in increase in antero-posterior diameter of the thoracic cavity.

3. Goskeret al., 2000.

Neglect of skeletal muscle from a low level of physical activity is also a factor that may have detraining effect on muscle mass. This will have an impact on the oxidative capacity of the skeletal muscles and it will reduce the proportion of muscle fibres from type I to type II.

4. Leelarungrayub et al., 2009

IC stretch is performed actively by thoracic mobility exercises. Passively IC stretch can be performed by thoracic rotation, mid sternum rotation, lateral thoracic stretching, through thoracic mobility exercises as well as through manual stretching of IC spaces.

5. Puckree et al. 2002.

IC stretching is effective in improving breathing pattern and respiratory muscle activity among healthy conscious adults. However; none of the research studies examined the effect of IC stretching on dynamic pulmonary function parameters among healthy subjects

6. Campbell et al., 1980.

Morphologically intercostal muscles displayed a variation in fibre size and atrophy among obstructive lung disease subjects.

7. Bolser et al., 1987.

The external IC muscles which are helpful during inspiration showed a higher discharge activity during forcible inhalation. Similarly, a stretch of 15 micrometres applied to IC spaces showed an increase in muscle activity in cats.

8. Hirai et al., 1996.

The IC muscles help both in inspiration and forced expiration. Even though these muscles engage in respiration, their activities are fewer during active contraction among normal healthy adults.

CHAPTER III

METHODOLOGY

3.1 STUDY DESIGN

Experimental Study Design

3.2 STUDY SETTING

The study was conducted at in patient department of Ashwini multi-speciality hospital Coimbatore.

3.3 SAMPLESIZE

All subjects were adults aged between 19 to 24 years old

3.4 SAMPLING TECHNIQUE

A randomized sampling technique. Experimental group-15 subjects and control group -15 subjects.

3.5 STUDY DURATION

This study duration was 30 days.

3.6STUDY METHOD

Subjects were blinded, assigned based on table of random numbers and they were allocated to the experimental group if they received an odd number, while subjects who received an even number were assigned to the control group.

With a mean age 21.73 years. Subjects were free from chronic diseases (WHO, 2005) and those with a history of rheumatologic disorders, smoking excluded from the study.

Ethical approval for the study was obtained from institutional review and ethical board of University Technology MARA, Malaysia and informed consent was obtained from the subjects before the study.

3.7 SELECTION CRITERIA

INCLUSION CRITERIA:

- AGE-40-50 yrs.
- SEX – males
- Chronic bronchial asthma more than 15 yrs.
- Stable clinic and Functional status

EXCLUSION CRITERIA:

- Severe cardiac disease
- Drug and alcohol abuse
- Renal failure and gastro intestinal disorder
- Arthritic patients
- Mechanical ventilator support
- Current psychiatric illness and
- Exercise induced asthma

3.8MATERIALS

Materials used are Stethoscope, Spirometer, Mercury Sphygmomanometer, Quadriceps table.

3.9 TREATMENT PROCEDURE

RESPIRATORY RATE

Before participation, all subjects underwent resting respiratory rate measurement. Initially the study subjects were requested to lie on a semi recumbent position and readings taken after 3 minutes of resting using auscultation methods.

The method adopted in this study to measure respiratory rate was reliable according to a protocol described earlier.

PULMONARY FUNCTION TEST

The ventilator parameters such as forced expiratory volume in 1st second (FEV1), forced vital capacity (FVC) and 286 forced expiratory volume in first second percentage (FEV1%), were measured by pulmonary function test.

A pulmonary function test was carried out by using the handheld spirometer to estimate the dynamic lung function parameters.

Participant's details were taken before pulmonary function testing such as age; height and weight using SECA weight and height scale.

According to the (ATS) / (ERS) task force, spirometer training and testing were performed to ensure quality (Miller et al., 2005a, b). Testing was carried out in standing position and rest interspersed between each of the three tests.

A chair was placed behind the participant, so that they could be quickly and easily moved into a sitting position if they feel any discomfort during the manoeuvre.

The participants were requested to perform at least three trails and the best of the three values for the manoeuvre such as slow vital capacity and forced vital capacity was taken by the same physiotherapist as suggested by ATS/ERS task force. The spirometer test was preceded with IC stretch.

IC STRETCH AND BREATHING CONTROL

For the experimental group, initially a stretch was applied by the same physiotherapist on the left-side midway between the mid auxiliary line and a line through the nipple in the downward direction of the third IC space.

The IC stretch was applied by the physiotherapist manually with the help of index finger over the third IC spaces in a caudad-cephalad direction to the upper borders of the fourth rib. Enough care was paid to avoid compression of the chest wall.

Breathing control exercises were performed followed by IC stretching.

This was performed in a comfortable semi recumbent position with a pillow under both knees. Participants were encouraged to place their hands over the upper abdomen.

As the subject breathed in, the hands were placed over the epigastria region to feel the rise; as they breathed out, the hand sank.

Fifteen subjects from the experimental group received IC stretch with breathing control exercises where as other fifteen subjects received breathing control exercises alone in the semi recumbent position.

Immediately, following intervention, the respiratory rates recorded and pulmonary function test were performed using spirometer to evaluate the effect of intervention in both groups.

Subjects underwent three IC stretch and breathing control exercises with a time gap of 2-3 minutes for the experimental group.

Each stretch was employed for ten breaths throughout the inspiratory phase of the respiratory cycle. For the control group they underwent breathing control exercise alone. A total of 15 minutes sessions lasted for both groups.

CHAPTER IV

DATA ANALYSIS AND RESULTS

DATA ANALYSIS:

All analyses were performed with SPSS version 17.0 software. The normality of the data was assessed using Kolmogorov-Smirnov.

Wilcoxon signed rank test was used to determine the effect of IC stretch in experimental and control groups. Also, Mann-Whitney test, performed to find out if differences existed between the experimental and control groups in each parameter.

RESULTS:

The characteristics of the study subjects were as follows:

TABLE 1: PHYSICAL CHARACTERISTICS OF THE STUDY SUBJECTS

	N	Minimum	Maximum	Mean	Std.Deviation
Age	30	19a	24a	21.73	1.721
Height	30	1.59b	1.79b	1.6853	0.04819
Weight	30	53c	104c	65.63	11.038
BMI	30	18.900	40.0000	23.146667	3.8837179
Valid N (list wise)	30				

- a indicates age in years
- b indicates height in centimetres
- c indicates weight in kilogram

TABLE 2: BASELINE CHARACTERISTICS OF RESPIRATORY RATE AND VENTILATOR PARAMETERS

	Pre RR[a]	Pre FEV1[b]	Pre FVC[c]	Pre FEV1%[d]
Mann-Whitney U	109.500	90.500	107.000	98.000
Wilcoxon W	229.500	210.500	227.000	218.000
Z	-0.126	-0.914	-0.228	-0.603
Asymp. Sig. (2-tailed)	0.900	0.361	0.819	0.547
Exact Sig. [2*(1-tailed Sig.)]	0.902	0.367	0.838a	0.567

- RR indicates respiratory rate
- FEV1 indicates forced expiratory volume in 1st second
- FVC indicates forced vital capacity
- FEV1% indicates ratio of a and b

The comparison of pre and post-test values of ventilatory parameters in experimental groups results showed there were significant differences in FEV1% ($P < 0.03$) compared to control groups ($P < 0.507$).

However, there were no significant differences in FEV1 and FVC are shown in Table 3. This showed that ICs stretch showed improvement in FEV1% in the experimental groups. Values in the experimental group than control group($P < 0.003$; $P < 0.042$) respectively given to the respondents in Table 4. This showed that ICs stretch showed some effect in reducing the respiratory rate.

The comparison of post intervention respiratory rate and ventilatory parameters between the group results showed there were significant difference between the groups in FEV1% alone ($P < 0.017$). How-ever, there were no significant differences among other parameters (Table 5).

This depicted that there were changes in FEV1% alone when an IC stretch performed breathing control exercises.

TABLE 3: COMPARISON OF PRE AND POST VENTILATORY PARAMETERS AMONG EXPERIMENTAL AND CONTROL GROUPS

	Post1-Pre1 FEV1a	**Post1-Pre1 FVCb**	**Post1-Pre1 FEV1%**	**Post2-Pre2 FEV1a**	**Post2-Pre2 FVCb**	**Post2-Pre2 FEV1%c**
Z	-0.778a	-1.387	-2.995	-0.787	0.000	-0.663
Asymp.Sig. (2-tailed)	0.436	0.166	0.003d	0.431	1.000	0.507

- FEV1 indicates forced expiratory volume in 1st second
- FVC indicates forced vital capacity
- Ratio of a and b
- Indicates significant difference found in experimental groups

TABLE 4: COMPARISON OF PRE AND POST RESPIRATORY RATE AMONG EXPERIMENTAL AND CONTROL GROUPS

	POST1 RR-PRE1RR	**POST2 RR[a] - PRE2 RR[a]**
Z	-3.002	-2.031
ASYMP. SIG. (2-TAILED)	.003b	.042

- RR indicates respiratory rate
- Indicates significant difference found in experimental group

TABLE 5: COMPARISON OF RESPIRATORY RATE AND VENTILATORY PARAMETERS BETWEEN THE GROUPS

	PRE RR[A]	PRE FEV1[B]	PRE FVC[C]	PRE FEV1%[D]	POST RR[A]	POST FEV1[B]	POST FVC[C]	POST FEV1%[D]
Mann-Whitney U	109.50	90.50	107.00	98.00	103.50	98.50	112.00	55.00
Wilcoxon W	229.50	210.50	227.00	218.00	223.50	218.50	232.00	175.00
Z	-0.126	-0.914	-0.228	-0.603	-0.376	-0.581	-0.021	-2.38
Asymp.Sig. (2-tailed)	0.900	0.361	0.819	0.547	0.707	0.561	0.983	0.017
Exact Sig. [2*(1-tailed Sig.)	0.902	0.367	0.838	0.567	0.713	0.567	1.000	0.016[e]

- RR indicates respiratory rate
- FEV1 indicates forced expiratory volume in 1st second
- FVC indicates forced vital capacity
- FEV1% indicates ratio of a and b
- Indicates significant differences found between the groups

CHAPTER V

DISCUSSION

The findings of this study showed there was improvement in dynamic ventilator parameter (FEV1/FVC %) among healthy conscious adults who had IC stretch with breathing control exercises compared to those with breathing control exercise alone.Clinically there were changes in FEV1 and FVC on certain subjects, despite no statistical changes in FEV1 and FVC.The result of the present study is similar to a previous study which reported there was an effect on static ventilator parameters (Puckree et al., 2002).

The present study is in accordance with an earlier study in which IC stretch was given as one of the sets of unsupported arm exercises (Mohanet al., 2010).The IC may enhance the chest wall elevation and thus increase expansion to improve intra-thoracic lung volume which contributes to improvement in flow rate percentage.

This may contribute to the increase in ventilatory capacity such as tidal volume, minute ventilation and oxygen status (Chang et al., 2002).The changes in ventilator parameters may be due to the firing discharge of the muscle spindle during a passive stretch phase (Hirai et al., 1996).

IC stretching may have activated the stretch receptors in the chest wall, thereby distending the thorax which could be neurologically linked to medulla with efferent nerve cells.This neuro-physiological facilitator stimulus may account for more normal respiratory patterns among unconscious subjects (Jennifer and Pryor, 2008), but the present study was carried out to discover the effect on IC stretch among male asthma subject.

Puckree et al. (2002) studied with the effect of IC stretch on third and the eighth IC space in which they proved there was decrease in breathing frequency when a stretch performed on third and eighth IC spaces.

`However, the rate of respiration lessened only in the experimental group, which showed there were impacts on respiratory rate also when an IC stretch was performed.Although there is a lack of evidence that supports the use of this technique, the results showed improvements in dynamic ventilator parameters (FEV1%).

A previous study reported that localized stretch in the third and eighth IC space showed a deeper breathing pattern, greater activities on parasternal ICs, electro myographic activities which resulted in an increase in tidal volume and a decrease in breathing frequency among asthma subjects (Puckreeetal., 2002)

In addition, Threlkeld (1992) reported that applying manual techniques such as IC stretch may produce a suitable amount of plastic deformation of connective tissue to enhance mobility at joints.Therefore, the results of this study provide a preliminance whereby IC stretch was an effective treatment parameter.

Hence, future studies on a larger sample size may corroborate the findings in detail. A Possible limitation of our study was Quantification of stretch pressure was not performed and it’s uncertain how far these stretch receptors stimulated to evoke response.The respiratory rate measurement which was used in our study did not provide a sensitive measure of change in the group (Evans et al., 2001). Therefore, future design of stretching protocol and its measured quantities in cardiorespiratory physiotherapy may be considered in order to promote ventilation.

CHAPTER VI

SUMMARY AND CONCLUSION

SUMMARY

A total number of 30 asthma male subjects were selected by randomized sampling method after considering in the selection criteria. The informed consents were obtained from each subject individually.

CONCLUSION

The present study showed there were increases in dynamic ventilator parameters only in FEV1% among healthy conscious subjects who underwent IC stretch compared to the subjects who underwent breathing control exercises alone for ten breaths. This change in ventilator parameters, enhanced lung volume when an IC stretch is performed. It can be necessitated that this IC stretch method might be an alternative for subjects incapable of engaging in active rehabilitation exercises.

This study provides baseline information for the changes in pulmonary function parameters after an IC stretch which could be useful in directing future studies on patient populations.

Thus, we speculate that this mode of stretch might help in promoting ventilation when it can be applied to subjects with pulmonary disease.

CHAPTER VII

LIMITATIONS AND SUGGESTION

LIMITATIONS

A possible limitation of our study was Quantification of stretch pressure was not performed and it's uncertain how far these stretch receptors stimulated to evoke response. The respiratory rate measurement which was used in our study did not provide a sensitive measure of change in the group.(Evans et al., 2001).

SUGGESTION

Future design of stretching protocol and its measured quantities in cardiorespiratory physiotherapy may be considered in order to promote ventilation.

CHAPTER VIII

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CHAPTER IX

ANNEXURE

ANNEXURE 1– INFORMED CONSENT FORM

TITLE: "A STUDY ON EFFECTIVENESS OF INTERCOSTAL STRETCH ON PULMONARY FUNCTION PARAMETERS IN BRONCHIAL ASTHMA MALE PATIENTS"

INVESTIGATOR **:** Dr.M.Periyanayagaswamy.

CO- INVESTIGATOR : Dr.K.Ramadevi

PURPOSE OF THE STUDY:

I_________________ have been informed that this study will help clinicians and therapists to find out the effect of intercostal stretch on pulmonary parameters in male asthma subjects.

PROCEDURE:

I________________ understand that, I will undergo experiment with Dr.M.Periyanayagaswamy and Dr.K.Ramadevi under the direct supervision of the physiotherapist. I am aware that i have to follow therapist's instruction as has been told to me.

RISK AND DISCOMFORT:

I________________ understand that there are no potential risks associated with this procedure, and understand that Dr.M.Periyanayagaswamy / Dr.K.Ramadevi will company me during this procedure, there are no known hazards associated with this procedure.

CONFIDENTIALITY:

I__________________ understand that the medical information produced by this study will be confidential. If the data are used for publication in the medical literature or for teaching purpose, no names will be used. And photographs, audio and video tapes will be used without identify for publication and presentation.

REQUEST FOR MORE INFORMATION:

I__________________ understand that i ask any questions about the study at any time Dr.M.Periyanayagaswamy and Dr.K.Ramadevi are available to answer my questions copy of this concern form will be given to me keep for my careful reading.

REFUSAL OR WITHDRAWL OF PARTICIPATION:

I___________________ understand that my participation is voluntary and I may withdraw consent and discontinue participation at any time after he has explained the reasons for doing so.

INJURY STATEMENT:

I______________________ understand that the diagnosis/treatment procedure, under the guidance of my therapist is likely to cause any/no injury.in such case medical attention will be provided, but no compensation will be provided. I understand my agreement to participate in this study and I am not waiving any of my legal rights.

I________________ confirm that Dr.M.Periyanayagaswamy and Dr.K.Ramadevi have been explained me the purpose of the study, the study procedure and possible risk that i may experience.

I have read and I have understood this concern to participate as subject in this study.

………………... …………………

SUBJECT **DATE**

……………………….. …………………...

WITNESS TO SIGNATURE **DATE**

Dr.M.Periyanayagaswamy and Dr.K.Ramadevi have been explained the purpose of the research, the procedure required and the possible risks and benefits, to the best of my ability.

…………………………. ………………….

INVESTIGATORS **DATE**

Dr.M.Periyanayagaswamy.

Dr.K.Ramadevi.

ANNEXURE 2

ASSESSMENT PERFORMA

SUBJECTIVE EXAMINATION:

- Name
- Age/gender
- BMI
- Occupation
- Contact no
- Address
- DOB
- Date
- Subject No:

Chief Complaints:

History of present illness:

- Onset
- Duration
- Frequency
- Aggravating factor
- Relieving factor
- Progression

Past History:

Family History:

Personal History:

- Appetite
- Sleep
- Habits: Alcoholic/Smoker

Vital signs:

- Heart rate
- Blood Pressure
- Respiratory Rate

OBJECTIVE EXAMNATION

ON OBSERVATION

- Built
- Endomorphic
- Ectomorphic
- Mesomorphic
- Chest
- Shape
- Symmetry
- Respiratory rate
- Pattern

ON EXAMINATION

- Chest expansion
- Upper zone
- Middle zone

- Lower zone
- Percussion
- Auscultation
- 6 minute walk test
- RPE
- Heart Rate
- Respiratory Rate
- PEFR measurement